Availability and Utilization of Cardiac Rehab in the VA: Current Challenges and Opportunities

Daniel E. Forman, MD

Director, Cardiac Rehabilitation,
Section of Cardiology;
Physician Scientist, Geriatric Research Education and Clinical Center,
VA Boston Healthcare System

Director, Cardiac Rehabilitation and
The Exercise Testing Laboratory
Division of Cardiovascular Medicine,
Brigham and Women's Hospital

Associate Professor of Medicine,
Harvard Medical School

Mary Whooley, MD, FACP, FAHA, FACC

Director, Cardiac Rehabilitation,
San Francisco VA Medical Center

Professor of Medicine and Epidemiology
University of California, San Francisco

April 29, 2013

Poll Question #1

- What is your primary role in VA?
  - student, trainee, or fellow
  - clinician
  - researcher
  - manager or policy-maker
  - Other

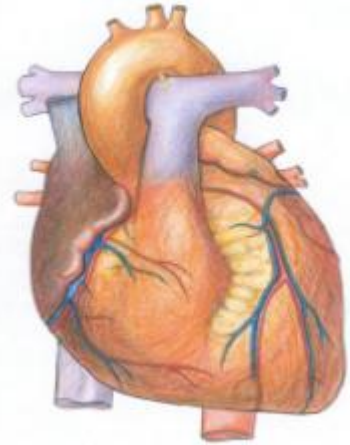
Poll Question #2

- What percent of eligible patients receive cardiac rehab in the VA?
  - Less than 10%
  - 10 to 25%
  - 26 to 50%
  - 51 to 75%
  - Greater than 75%

Poll Question #3

- Which statement best describes your personal experience with cardiac rehab?
  - I am not familiar with cardiac rehab
  - I am familiar with cardiac rehab but have not used it
  - I have referred patients for cardiac rehab
  - I am a cardiac rehab provider
  - I conduct research about cardiac rehab

Cardiac Rehabilitation in VHA



- History of Cardiac Rehabilitation (Forman)
- Current Status (Whooley)
- Challenges for Implementation (Forman)
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History of Cardiac Rehabilitation

Underuse of Cardiac Rehabilitation

Post-MI once regarded as a period in which physical movement was highly destabilizing and harmful.

- Bernard Lown (*Re. AMI therapy in the 1950s*):

  Patients were confined to strict bedrest for four to six weeks. Sitting in a chair was prohibited. They were not allowed to turn from side to side without assistance. During the first week, they were fed. Moving their bowels and urinating required a bedpan.

Getting AMI Patients Out of Bed:

Controversial Care

- **Predictions that patients would experience fatal arrhythmias, heart rupture, or congestive heart failure from an overstressed heart muscle**

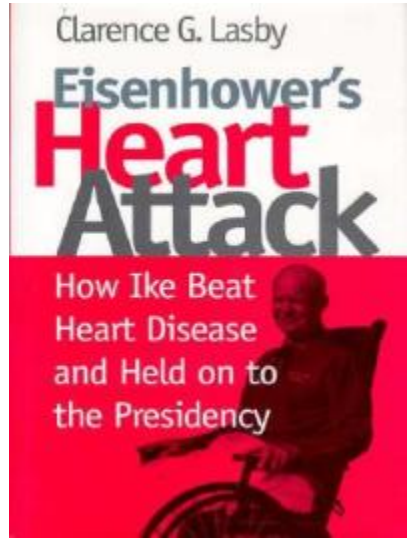
Levin S, Lown B. NEJM. 1952;148:1365-9

Dwight Eisenhower

Heart attack in office in 1955

Paul Dudley White prescribed graded levels of exercise (swimming, walking, and golf).

Viewed by many physicians as reckless and inappropriate, but results remarkably positive



Historical orientation overshadows broader relevance of Cardiac Rehabilitation in 2013

Multifactorial Program:

- Exercise/physical activity
  - Prescription and Surveillance: Advance activity amidst clinical instability
- Education
- Risk factor management
- Nutrition (weight management)
- Psychosocial support

Team Approach

- Cardiologist; Nurse; Exercise physiologist; Nutritionist; Psychologist

Paradigm of Cardiac Rehabilitation (1970's-1980's)

- Oriented to
  - Completed MI
  - Ischemic cardiomyopathy
    - Pro-ischemic; Pro-arrhythmic
    - Hemodynamically unstable
- Cardiac rehabilitation as a means

  to initiate and advance exercise for a population presumed unstable.
- Conceptualized as a means to get a "man back to work"

Insurance Eligible

- CAD: Revascularized (CABG), stable angina, recent MI
  - Added to recent ACS guidelines
- Recently Expanded Eligibility:
  - MI within the preceding 12 months
  - Percutaneous coronary intervention
  - Heart valve repair/replacement
  - Heart or heart-lung transplant
  - Heart Failure
  - PAD
  - 1° Prevention for women

- Heart failure, PAD, and Primary Prevention not currently covered for CR by most insurers

3 Phases of Cardiac Rehabilitation

- Phase I: inpatient phase (1960s), early graded mobilization to the level of activity required to perform simple household tasks.
- Phase II: hospital-based outpatient program (1970s on) monitored exercise and risk factor reduction.
- Phase III: maintenance phase. Hospital- or medically-based; goal of continuing the risk factor modification and maintaining exercise intensity.

Exercise Training

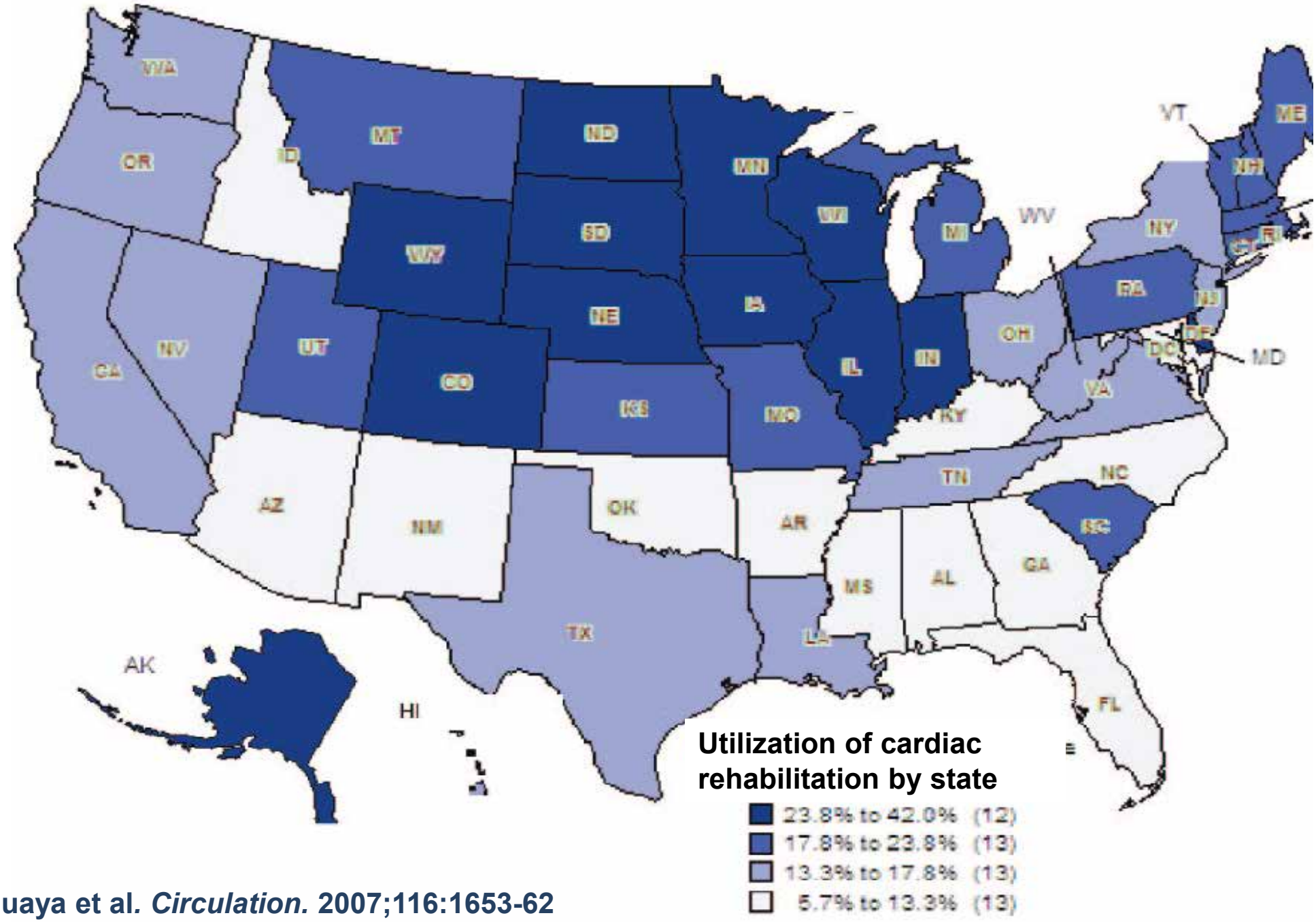
- **Class B:**

  Clinically stable; Low risk of CV complications

- **Class C:**

  Moderate–High risk of CV complications (Hx low EF, cardiac arrest, NYHA class III or IV, low Ex capacity, or residual ischemia

- **Exercise Prescription**
  - **Intensity**
  - **Mode**
  - **Frequency**
  - **Content and duration**



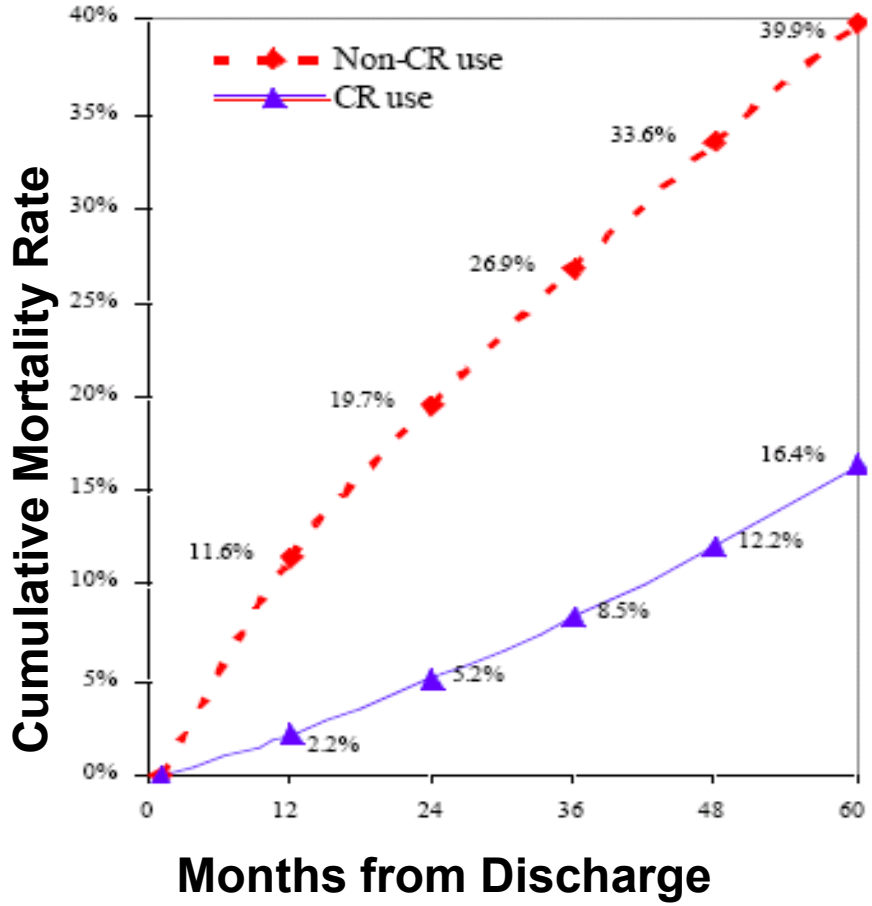
J Suaya et al. *Circulation.* 2007;116:1653-62

♀♂ Therapeutic Goals 2013

- Physical Activity (Surveillance, education)
- Risk Factor Modification (Rx, Education)
  - Tobacco, Diabetes, Blood Pressure, Cholesterol, Weight, Inflammation
  - Stabilize Coronary Plaque, endothelial responsiveness, distensibility, remodeling

- Modify Stress, Anxiety, Depression
- Diet (salt, cholesterol, cooking, restaurants, weight loss)
- Return to work, key family roles, QOL, independence, rehospitalization

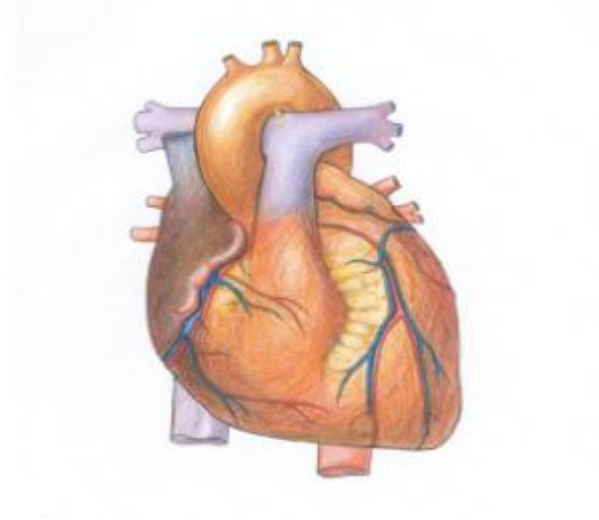
Cardiac Rehabilitation and Survival



- **21-34% Mortality Reduction**
- **Advanced ages**
- **Socioeconomic range**
- **ACS: Revasc, HF**
- **Severity of dz**
- **Extent of Comorbidity**

Suaya JA, et al. JACC. 2009; 54:25-33

Cardiac Rehabilitation in VHA



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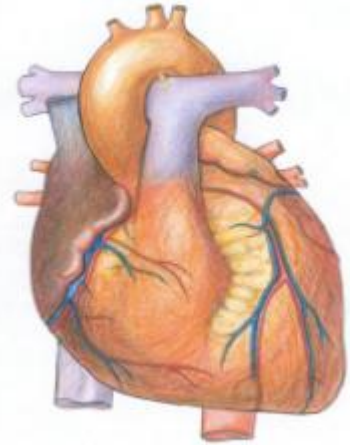

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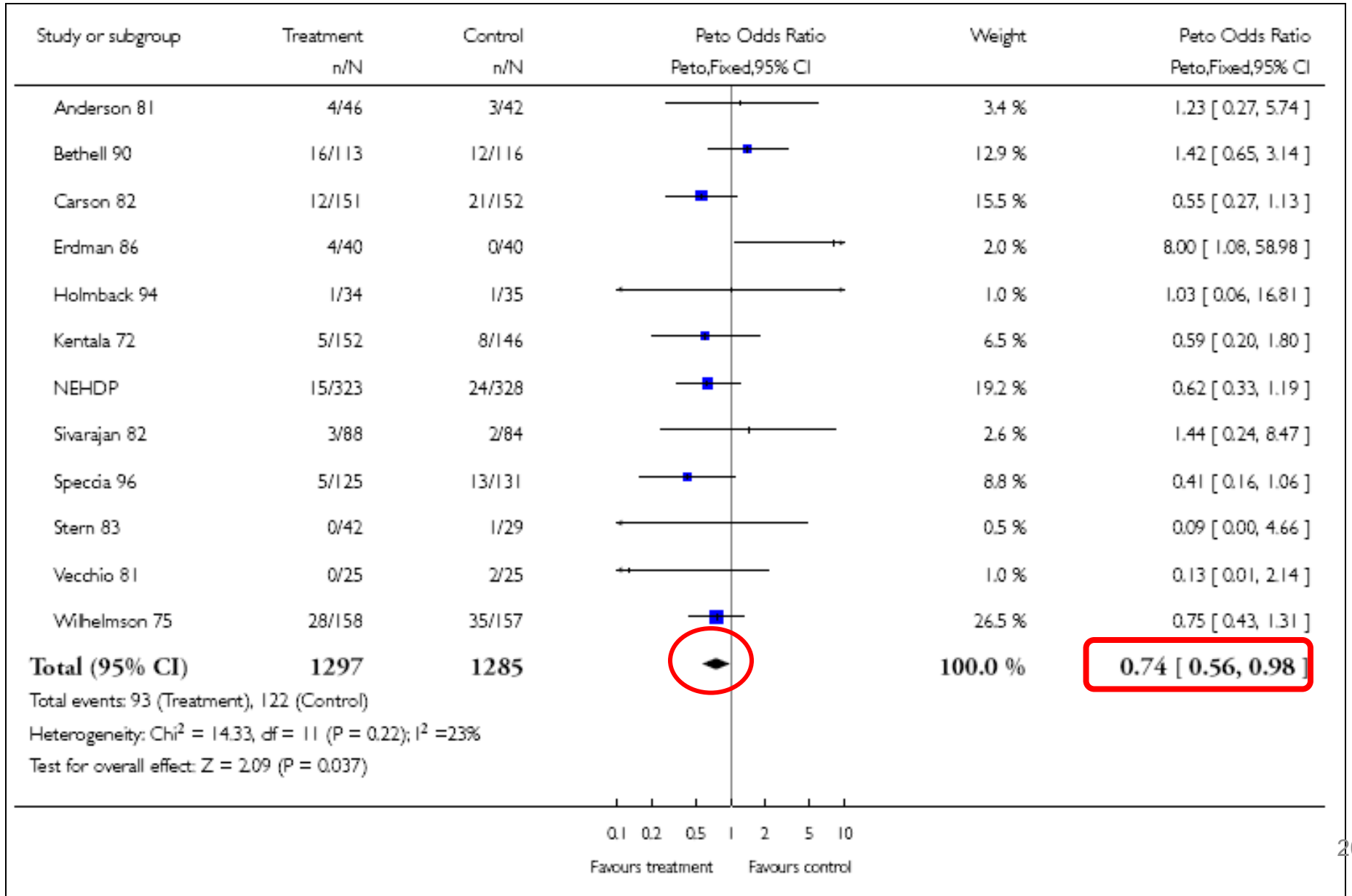
Exercise-based rehabilitation for coronary heart disease (Review)

Jolliffe J, Rees K, Taylor RRS, Thompson DR, Oldridge N, Ebrahim S

26% reduction in mortality among patients with CHD



Efficacy and Safety of Exercise Training in Patients With Chronic Heart Failure
HF-ACTION Randomized Controlled Trial

Decreased CV mortality or HF hospitalization, JAMA 2009;301:1439-50

Effects of Exercise Training on Health Status in Patients With Chronic Heart Failure
HF-ACTION Randomized Controlled Trial

Improved quality of life, JAMA 2009;301:1451-1459

Effects of Exercise Training on Depressive Symptoms in Patients With Chronic Heart Failure
The HF-ACTION Randomized Trial

Lower depressive symptoms, JAMA 2012;308:465-474

Performance Measures for Referral to Cardiac Rehab

AACVPR/ACCF/AHA Performance Measures

AACVPR/ACCF/AHA 2010 Update: Performance Measures on Cardiac Rehabilitation for Referral to Cardiac Rehabilitation/Secondary Prevention Services

A Report of the American Association of Cardiovascular and Pulmonary Rehabilitation and the American College of Cardiology Foundation/American Heart Association Task Force on Performance Measures (Writing Committee to Develop Clinical Performance Measures for Cardiac Rehabilitation)

Endorsed by the American College of Chest Physicians, the American College of Sports Medicine, the American Physical Therapy Association, the Canadian Association of Cardiac Rehabilitation, the Clinical Exercise Physiology Association, the European Association for Cardiovascular Prevention and Rehabilitation, the Inter-American Heart Foundation, the National Association of Clinical Nurse Specialists, the Preventive Cardiovascular Nurses Association, and the Society of Thoracic Surgeons

WRITING COMMITTEE MEMBERS
Randal J. Thomas, MD, MS, FAACVPR, FACC, FAHA, Chair; Marjorie King, MD, FAACVPR, FACC; Karen Lui, RN, MS, FAACVPR; Neil Oldridge, PhD, FAACVPR, FACSM; Ileana L. Piña, MD, FACC; John Spertus, MD, MPH, FACC

Patients Who Should be Referred from an Inpatient Setting (AACVPR/AACF/AHA Performance Measures):

All patients with a primary diagnosis of:

- Myocardial infarction
- Chronic stable angina
- Heart failure
- Peripheral artery disease

All patients status post one of these procedures:

- Coronary artery bypass grafting
- Percutaneous coronary intervention
- Cardiac valve surgery
- Cardiac transplantation

Circulation. 2011;124:2458-2473

Patients Who Should be Referred from an Outpatient Setting (AACVPR/AACF/AHA Performance Measures):

All patients who within the past 12 months have experienced:

- Acute myocardial infarction
- Chronic stable angina
- Coronary artery bypass grafting
- Cardiac valve surgery
- Cardiac transplantation
- Percutaneous coronary intervention

Circulation. 2011;124:2458-2473

Performance Measures for Secondary Prevention

ACCF/AHA/AMA–PCPI Performance Measures

ACCF/AHA/AMA–PCPI 2011 Performance Measures for Adults With Coronary Artery Disease and Hypertension

A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Performance Measures and the American Medical Association–Physician Consortium for Performance Improvement

Developed in Collaboration With the American Academy of Family Physicians, American Association of Cardiovascular and Pulmonary Rehabilitation, American Association of Clinical Endocrinologists, American College of Emergency Physicians, American College of Radiology, American Nurses Association, American Society of Health-System Pharmacists, Society of Hospital Medicine, and Society of Thoracic Surgeons

Drozda et al. Circulation. 2011;124:248-270

Performance Measures for Secondary Prevention

1) Blood pressure control
2) Lipid control
3) Smoking cessation
4) Anti-platelet therapy
5) Beta-blocker therapy
6) ACE/ARB therapy
7) Physical activity assessment
8) Symptom management
9) Cardiac rehabilitation

Drozda et al, Circulation. 2011;124:248-270

Performance Measures for Secondary Prevention

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9) Cardiac rehabilitation

"All patients evaluated in an outpatient setting who within the previous 12 months have experienced acute MI, CABG, PCI or who have chronic stable angina and have not already participated in a cardiac rehab or secondary prevention program for the qualifying event/diagnosis must be referred to such a program."

Drozda et al, Circulation. 2011;124:248-270

Suaya et al. *Circulation.* 2007;116:1653-62

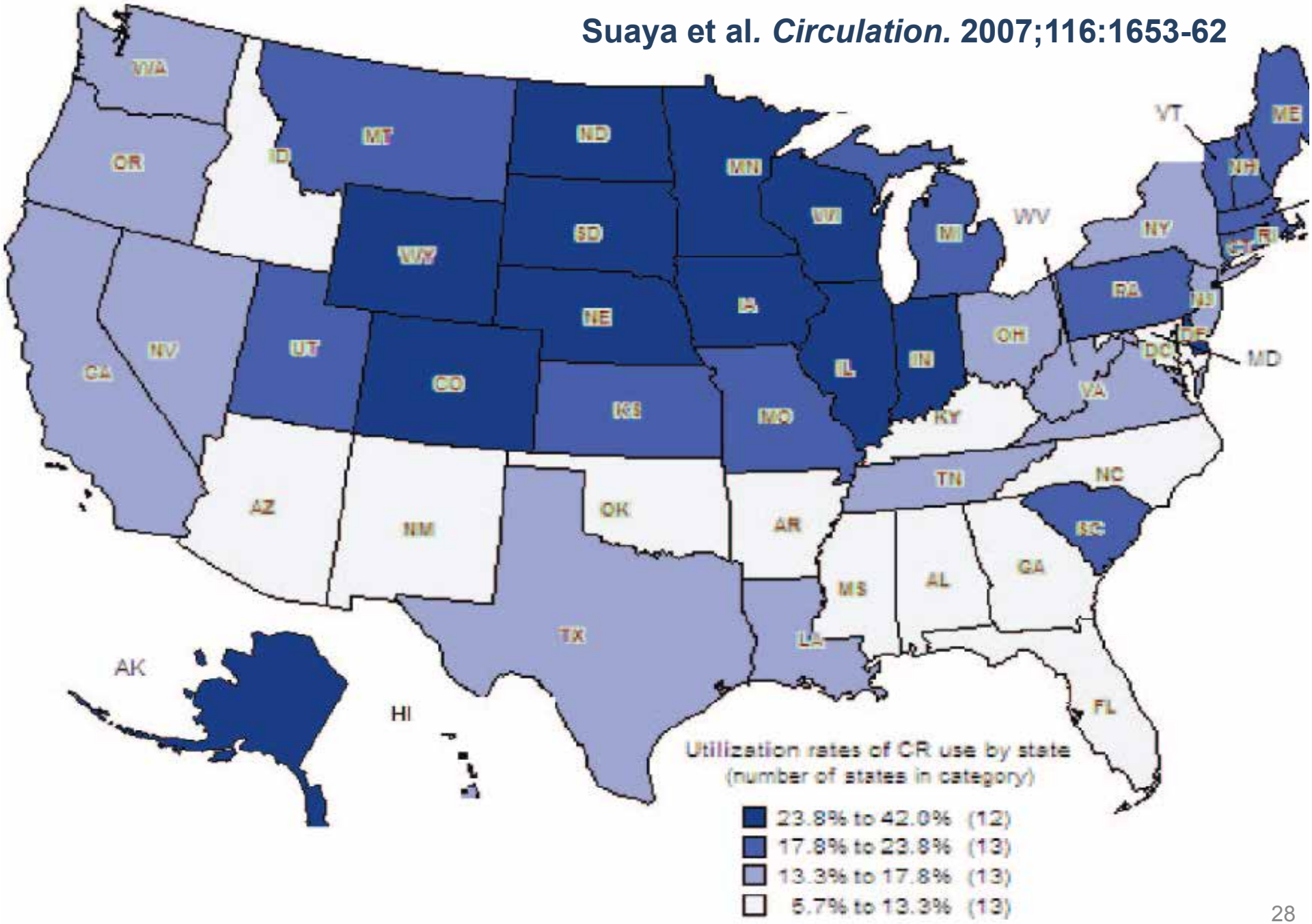
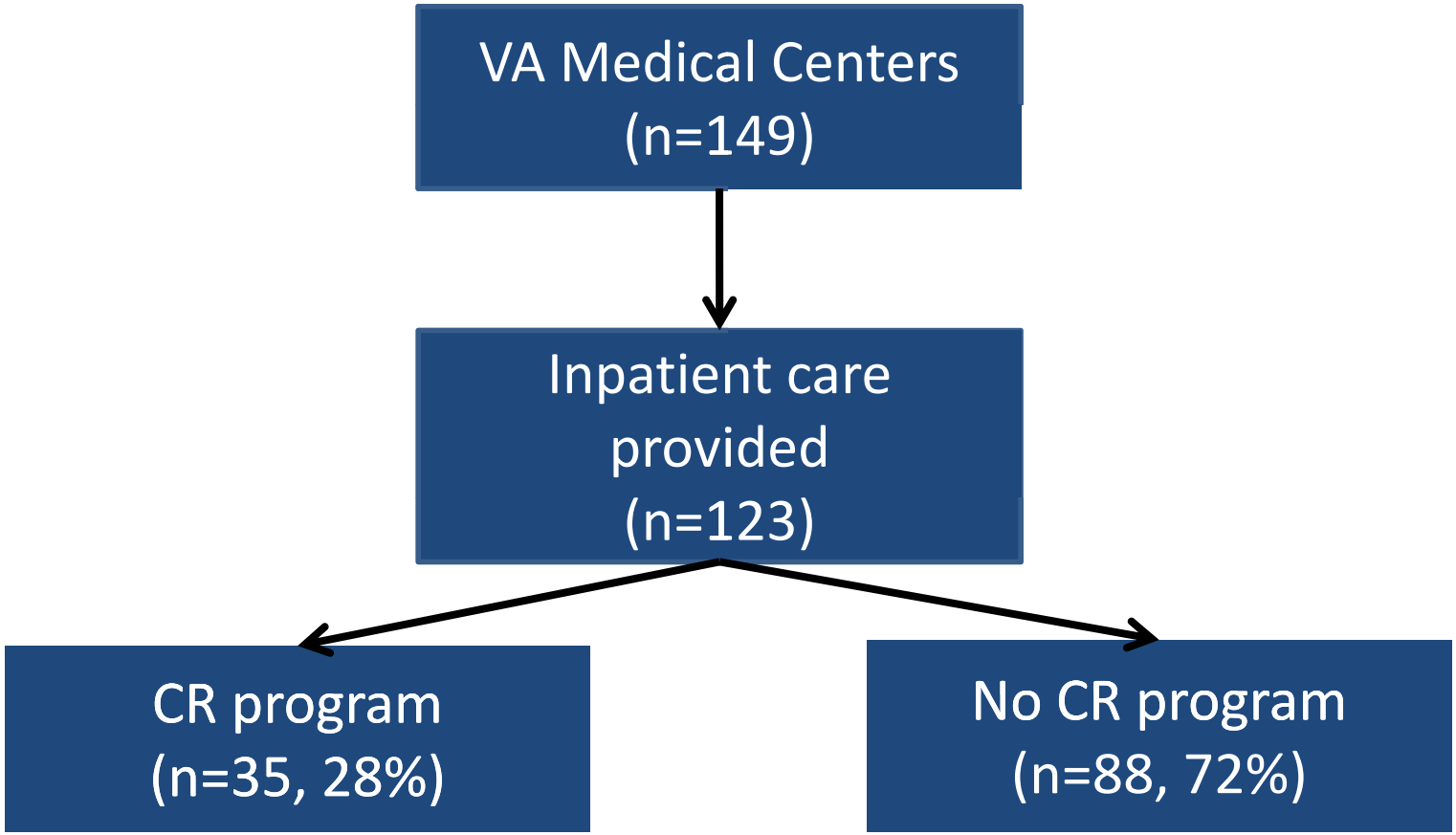


Figure. Standardized rates of CR by state.

2011 Survey of VA Cardiovascular Specialty Care Services *(Healthcare Analysis & Information Group)*



Schopfer D, presented at AHA Scientific Sessions, Nov 2012

35 VA Facilities with Onsite Cardiac Rehab (by VISN)

1	Boston HCS-West Roxbury
2	Syracuse, NY
2	Western New York HCS
3	New Jersey HCS-East Orange
3	New York Harbor HCS-Brooklyn
3	New York Harbor HCS-New York
3	Northport, NY
4	Wilkes-Barre, PA
5	Washington, DC
6	Richmond, VA
7	Augusta, GA
8	Bay Pines HCS
8	Caribbean HCS-San Juan
8	Miami HCS
8	Tampa, FL
8	West Palm Beach, FL
9	Louisville, KY
10	Cleveland, OH-Wade Park
10	Dayton, OH
11	Ann Arbor HCS
12	Hines, IL
12	Madison, WI
12	Milwaukee, WI
15	Columbia, MO
16	Houston, TX
16	Oklahoma City, OK
17	North Texas HCS
18	Phoenix, AZ
19	Montana HCS
19	Salt Lake City HCS
20	Puget Sound HCS-Seattle
22	Greater Los Angeles HCS
22	Long Beach HCS
23	Black Hills HCS-Fort Meade
23	Black Hills HCS-Hot Springs

VA HSR&D QuERI Rapid Response Proposal 12-232

- **Number of Veterans hospitalized 2008-2011:**

- 20,837 myocardial infarction
- 25,214 percutaneous coronary intervention
- 10,989 coronary artery bypass grafting

- **Proportion who participated in CR (VA or non-VA):**

- 8.9% at VA facilities with onsite CR program
- 5.1% at VA facilities without onsite CR program

Common Barriers

- **Patient-level factors:**
  - Distance from center
  - Lack of transportation
  - Financial constraints
  - Time off from work
  - Limited motivation

Schopfer D, presented at AHA Scientific Sessions, Nov 2012

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- **Provider-level factors**
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- **Provider-level factors**
  - Awareness of guidelines
  - Unsure how to refer
- **System-level factors:**
  - Poor reimbursement
  - Variability /complexity of programs

Schopfer D, presented at AHA Scientific Sessions, Nov 2012

AHA Presidential Advisory

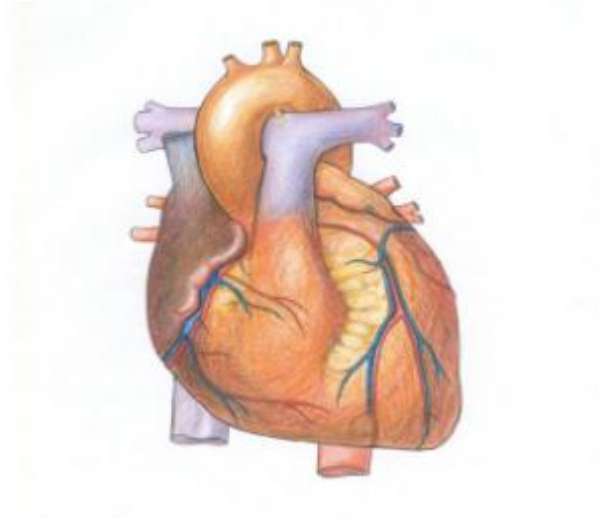
Referral, Enrollment, and Delivery of Cardiac Rehabilitation/Secondary Prevention Programs at Clinical Centers and Beyond

A Presidential Advisory From the American Heart Association

Gary J. Balady, MD, FAHA, Chair; Philip A. Ades, MD; Vera A. Bittner, MD, FAHA; Barry A. Franklin, PhD, FAHA; Neil F. Gordon, MD, PhD, MPH; Randal J. Thomas, MD, FAHA; Gordon F. Tomaselli, MD, FAHA; Clyde W. Yancy, MD, MSc, FAHA

The remarkably wide treatment gap between scientific evidence of the benefits of cardiac rehabilitation and clinical implementation of rehabilitation programs is unacceptable.

Cardiac Rehabilitation in VHA



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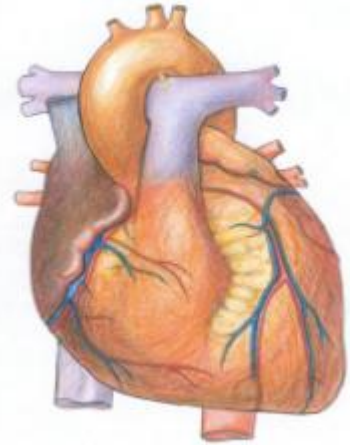

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Secondary Prevention: Recognizing the need

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Each year, an estimated 785 000 Americans will suffer a new myocardial infarction (MI; heart attack), and nearly 470 000 will have a recurrent attack.[1] Within 5 years of an initial MI, 15% of men and 22% of women 45 to 64 years of age and 22% of men and women >65 years of age will suffer a recurrent MI or fatal coronary heart disease (CHD).[1] Given this high recurrence rate, preventing secondary cardiac events is an essential part of the care for patients with cardiovascular disease (CVD).

Cardiac rehabilitation/secondary prevention programs (CR/SPPs) are medically supervised programs that help patients with CVD to recover more quickly after a cardiac event and to stay healthy. CR/SPPs are more than just diet and exercise programs; these programs offer a multifaceted and multidisciplinary approach to optimize the overall physical, mental, and social functioning of people with CVD. CR/SPPs include specific core components that aim to optimize cardiovascular risk reduction, foster healthy behaviors and compliance with these behaviors, reduce disability, and promote an active lifestyle for patients with CVD.[2] Comprehensive CR/SPPs consist of baseline patient assessment, nutritional counseling, aggressive risk factor management (ie, lipids, hypertension, weight, diabetes mellitus, and smoking), psychosocial and vocational counseling, and physical activity counseling and exercise training. Patients participating in CR/SPPs are also prescribed cardioprotective drugs that have evidence-based efficacy for secondary prevention. The goal of cardiac rehabilitation and secondary prevention is to stabilize, slow, or even reverse the progression of CVD, which in turn reduces the risk of a future cardiac event. The interventions provided by CR/SPPs are especially important because of the limited time available during the shortened hospital stays and brief outpatient physician visits now common in contemporary medical practice.

There is ample evidence on the proven benefits of CR/SPPs on CHD risk factors and exercise capacity.[3] Moreover, recent data demonstrate that participation in CR/SPP is associated with a reduction in mortality after percutaneous coronary interventions[4] and with a dose-dependent reduction in both mortality and recurrent MI for those patients with stable angina or patients after MI or coronary artery bypass surgery.[5] Given the significant benefits that CR/SPPs bring to CVD prevention, every recent major evidence-based guideline from the American Heart Association (AHA) and the American College of Cardiology Foundation (ACCF) about the management and prevention of CHD provides a Class I–level recommendation (ie, procedure/treatment should be performed/administered) for referral to a CR/SPP[6] for those patients with recent MI or acute coronary syndrome, chronic stable angina, heart failure, or after coronary artery bypass surgery or percutaneous coronary intervention. CR/SPPs are also indicated for those patients after valve surgery or cardiac transplantation.[6]

There is a need…

There is proven efficacy…

How to modify process of care to better suit the patients?

Challenges of Secondary Prevention

- Risk factor modification often complicated, especially amidst multimorbidity and polypharmacy
- Exercise neither intuitive or easily adapted.
- Behavior changes are hard to sustain
- Meaningful education hard to achieve

- How to achieve *personalized care more* comprehensively and with greater efficiency?

Secondary Prevention: harder than it seems…

Physical Activity,
diet, tobacco,
medical compliance

Personalized Care

- Relatively more patients are stable from a CV perspective, but more are vulnerable from a composite health perspective

Complexity of most patients

- Age, multimorbidity, polypharmacy
- Life stressors—divorce, finances, job
- Education, socioeconomics, family dynamics, pain, depression, nutrition
- Frailty
  - Physical limitations
  - Cognition

Cardiac Rehabilitation is useful

- Redefining the process of care to better capitalize on its benefits
  - Access; Relevance for patients
- Are there key elements or CR that may be similarly or better achieved at home or in a community setting?
- Technology may help facilitate exercise, education, and risk factor modification

Technology-augmented care
modifying the paradigm

- Technology facilitates
  - Virtual provider in your home
    - Reinforce links to exercise physiologist, nutritionist, nurse, physician
  - Virtual community
    - Reinforce links to members of the group

- Out of the hospital can be <u>better</u> medicine

Linking the patient to the provider and the hospital structure

Physical monitoring is one component

- Means to facilitate guidance and proactive care.

- Relative safety with contemporary care (revascularization and medical therapy), but…
  - —Ischemia, hemodynamics, arrhythmia, balance
  - —Age and complexity of patients (Comorbidity, Medications, Mood)
  - —Sensory, cognitive, and physical limits

Technology-augmented education and risk factor modification

Day-to-day prompts: links to pertinent education with different levels of sophistication

- Immediate feedback
  - Medical questions
  - Dietary questions
  - Symptoms and signs

Potential to share information: to reinforce/refine care

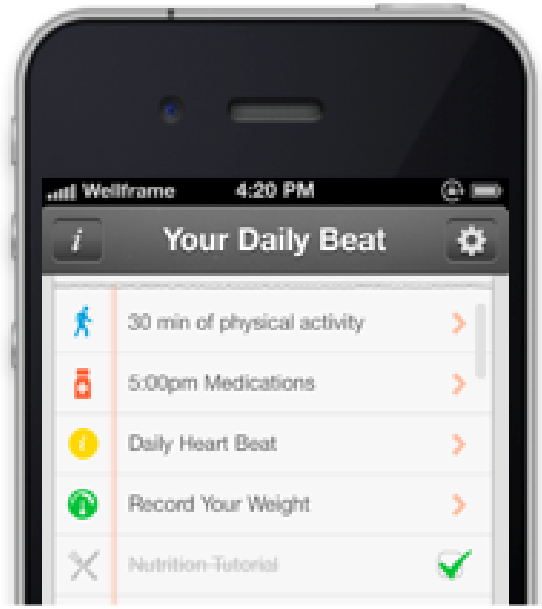
  - Medical staff, designated family members
  - Reduce risk, increase compliance

Generating Data

Data that are linked to a programmatic CR design

Objective Tracking:

Accelerometer data to track day-to-day activity



Daily Guidance:

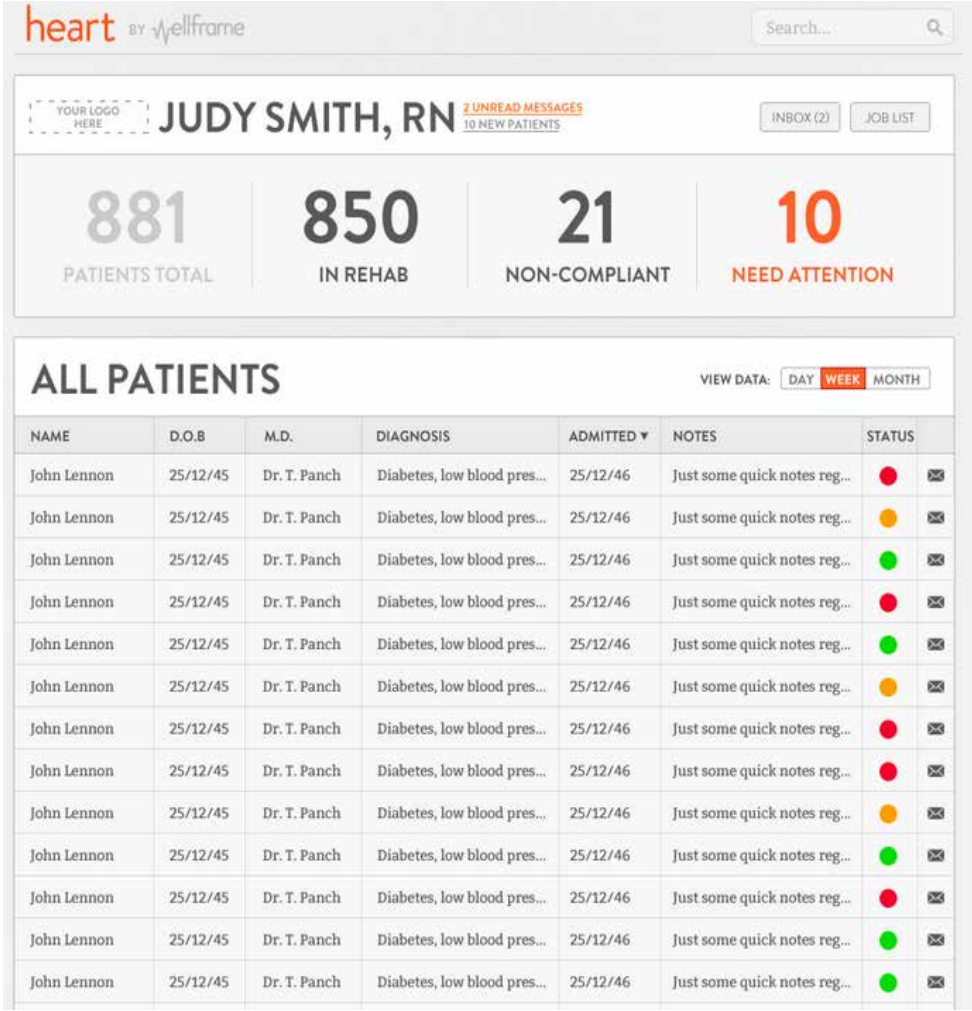
Personalized prompts for daily activity, therapy (compliance), and daily education

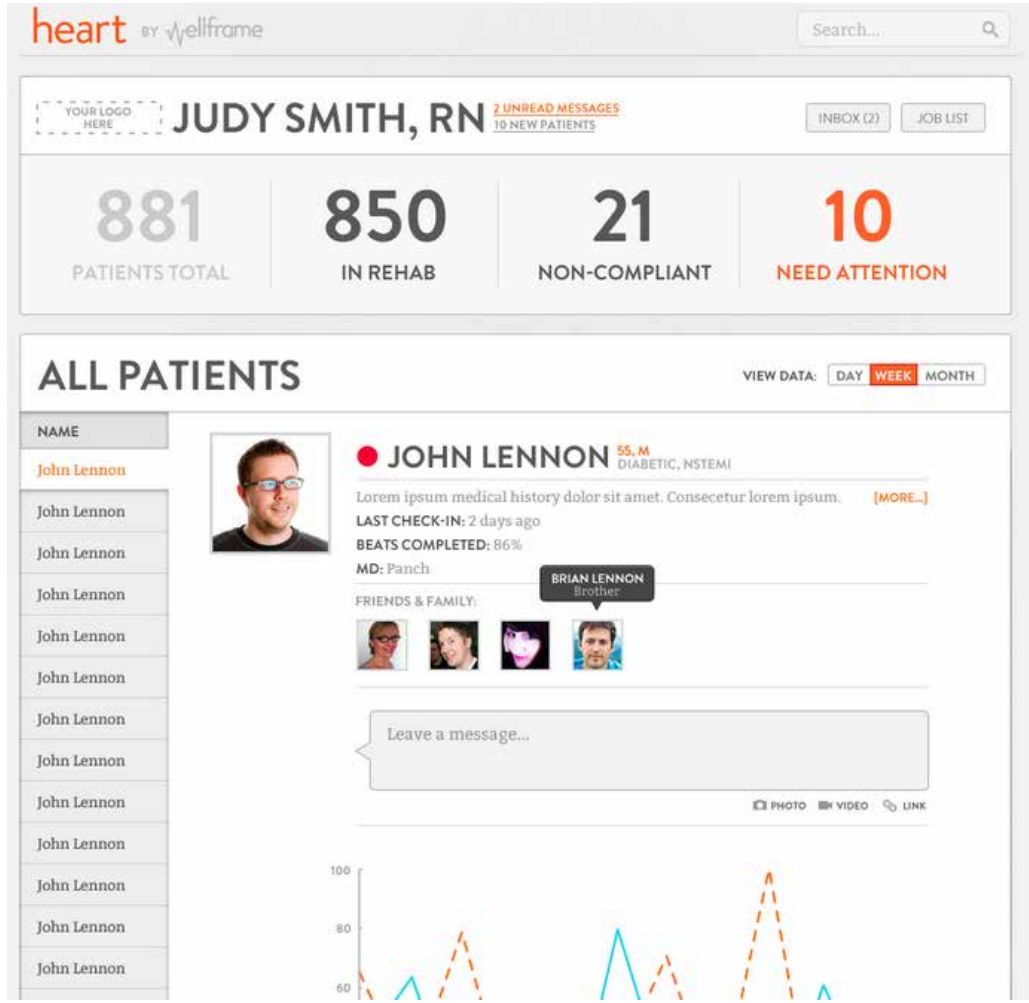
Potential Links:

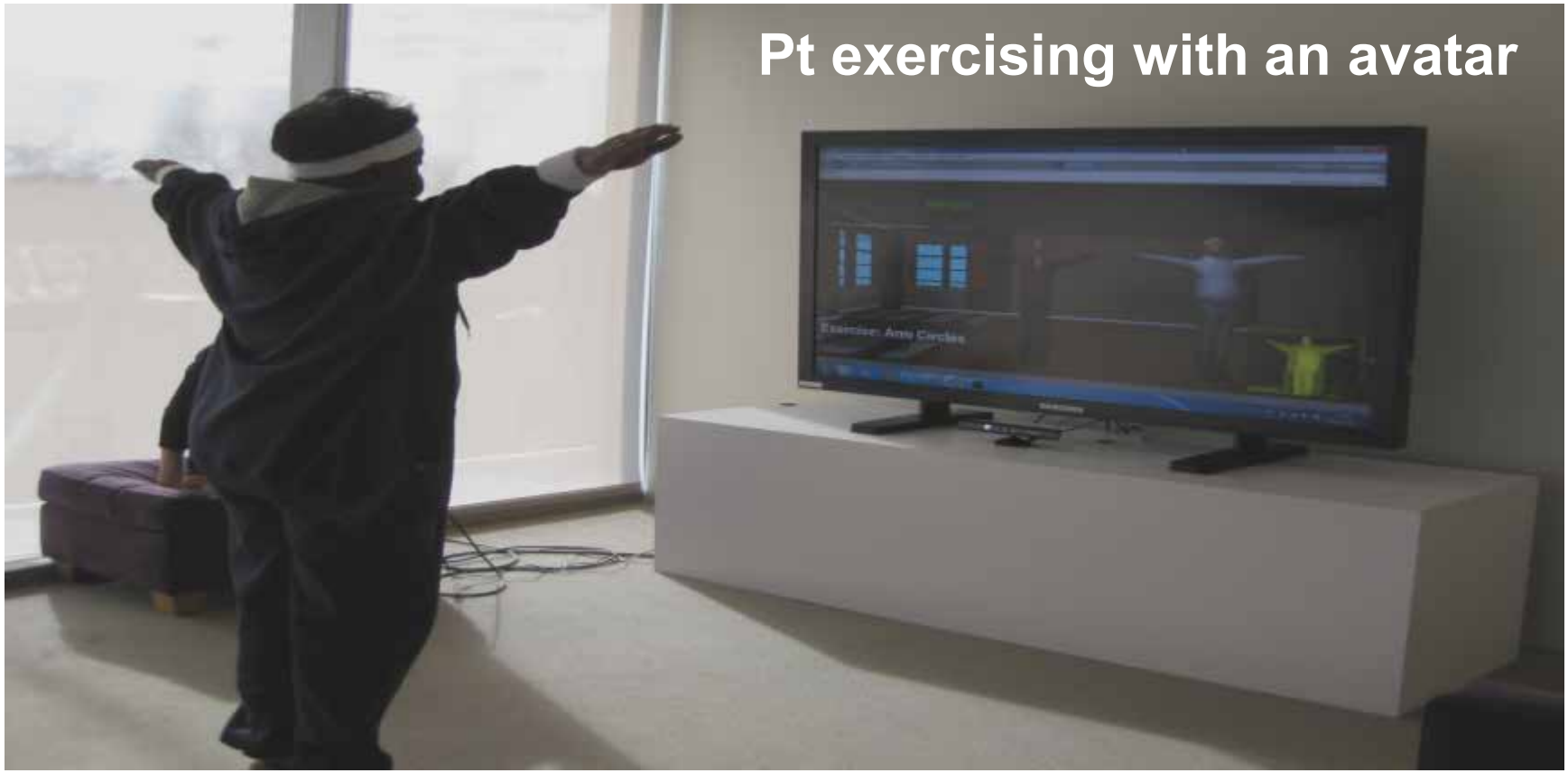
Links to CR staff, as well as to designated family members, and/or to others in CR

For Clinicians:

Efficiencies…and enhancement of care







Next generation:

Visual feedback… Watching a trainer, watching your own body movements (position, breathing)

- Multiple patients monitored by providers
- Patients can be watching other patients

Strength training, balance training, broader groups of patients

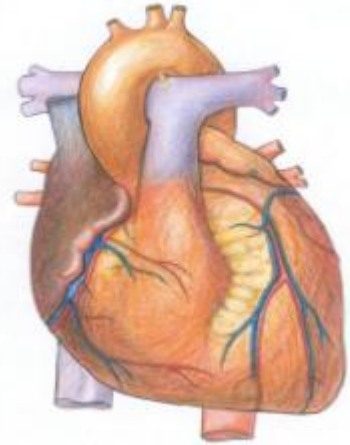
Efficiency and Personalized-care

- Linking providers to more patients with greater efficiency, but also higher quality
- Tailored-care that responses to each patient's circumstances

Cardiac Rehabilitation Hybrid Model

- Technological links can be initiated as part of acute care
  - Options for better hospital-based outpatient program
  - Options for better home care
  - Options for better community care
- *Overriding goals to establish therapeutic models that increase efficiency and quality of care.*

Cardiac Rehabilitation in VHA



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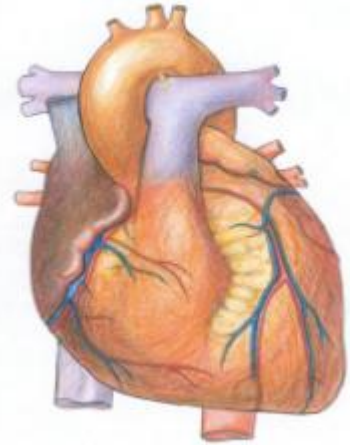

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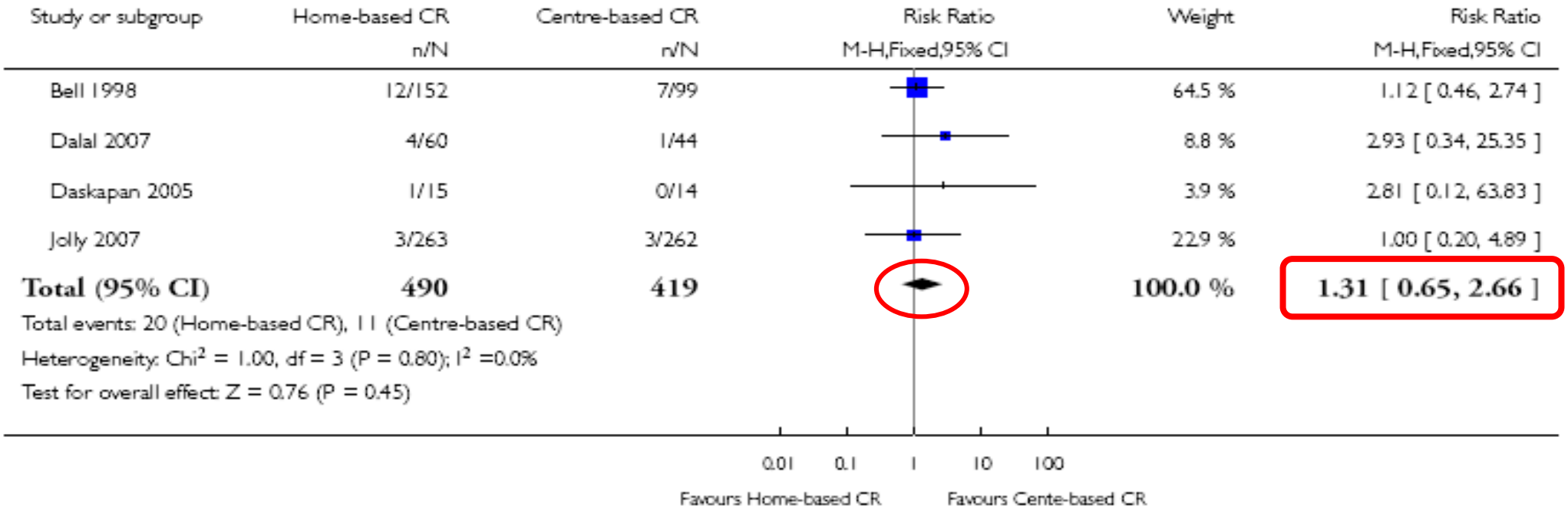
35 Cardiac Rehab Centers in VHA

Of the 9.3 million Veterans currently enrolled in VHA,
6.9 million (74%) live more than 60 minutes from a VA CR center.

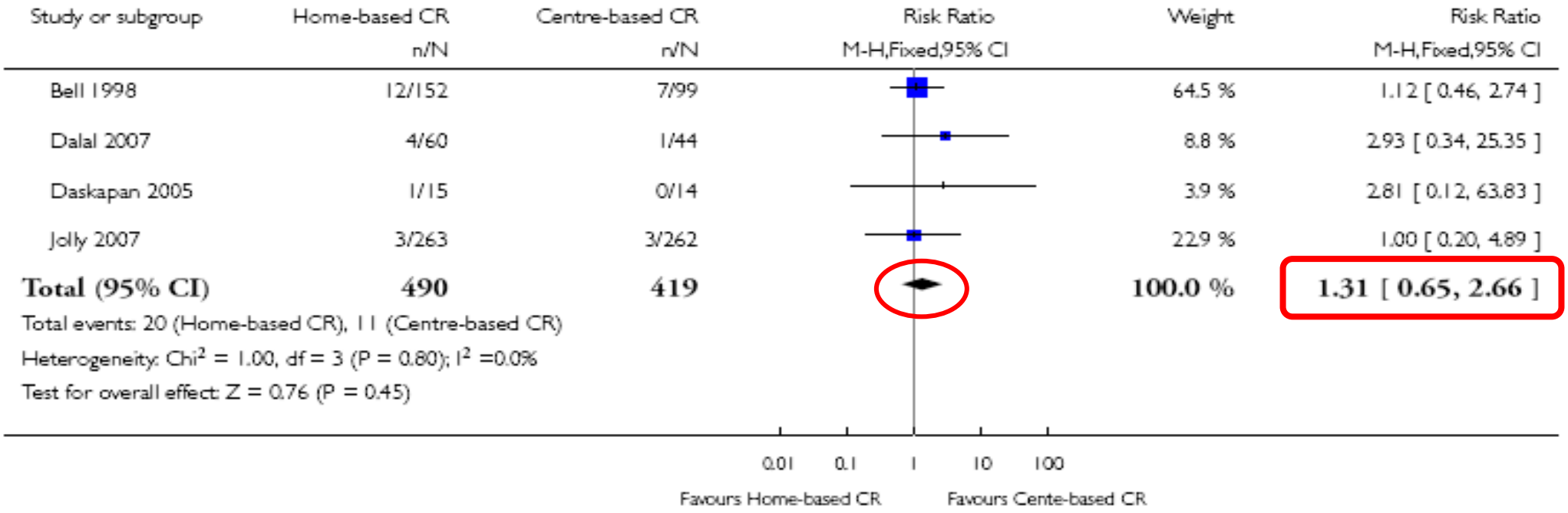
Home-based versus centre-based cardiac rehabilitation (Review)

Taylor RS, Dalal H, Jolly K, Moxham T, Zawada A

No significant difference in mortality (home vs. center-based)

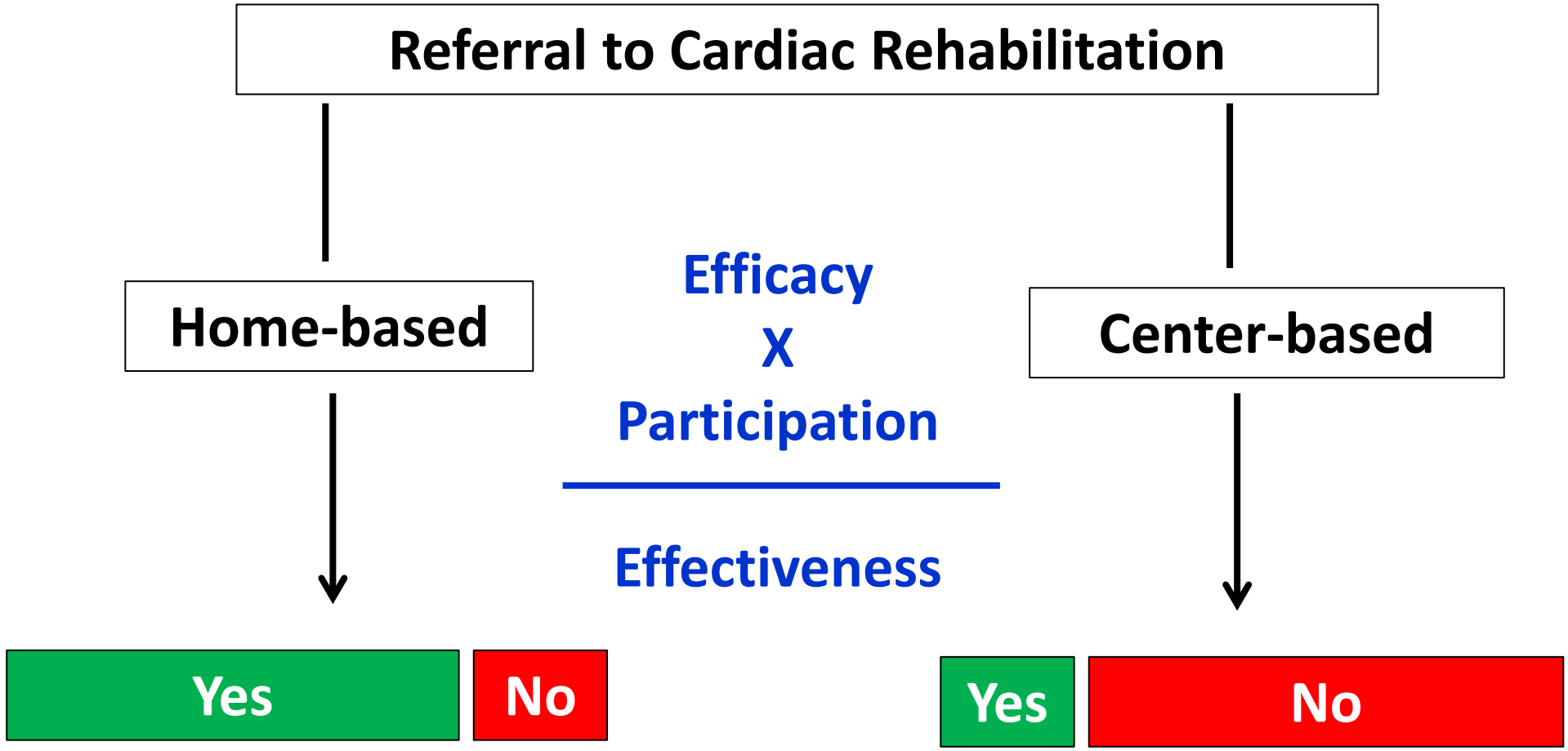


No significant difference in mortality (home vs. center-based)



"Home- and center-based CR programs appear to be equally effective in improving the clinical and health-related quality of life outcomes in acute MI and revascularization patients. This finding, together with an absence of difference in healthcare costs between the two approaches, would support the extension of home-based programs. "

Similar efficacy x greater participation may lead to greater effectiveness



AHA/ACCF Secondary Prevention and Risk Reduction Therapy for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2011 Update

A Guideline From the American Heart Association and American College of Cardiology Foundation

Endorsed by the World Heart Federation and the Preventive Cardiovascular Nurses Association

"A **home-based CR program** can be substituted for a supervised, center-based program for low-risk patients."

(Class I Recommendation; Level of Evidence A)

The Safety of Cardiopulmonary Exercise Testing in a Population With High-Risk Cardiovascular Diseases

Joseph Skalski, MD; Thomas G. Allison, PhD, MPH; Todd D. Miller, MD, FAHA

5060 exercise studies in 4250 high risk patients, including:

- N= 1289 Congestive Heart Failure
- N= 598 Hypertrophic Cardiomyopathy
- N= 194 Pulmonary Hypertension
- N= 212 Aortic Stenosis
- N= 686 Age 75 or Older
- N= 1748 Women
- N= 1192 Peak V02 < 14 ml/kg/min

Skalski et al, *Circulation* 2012;126:2465-2472

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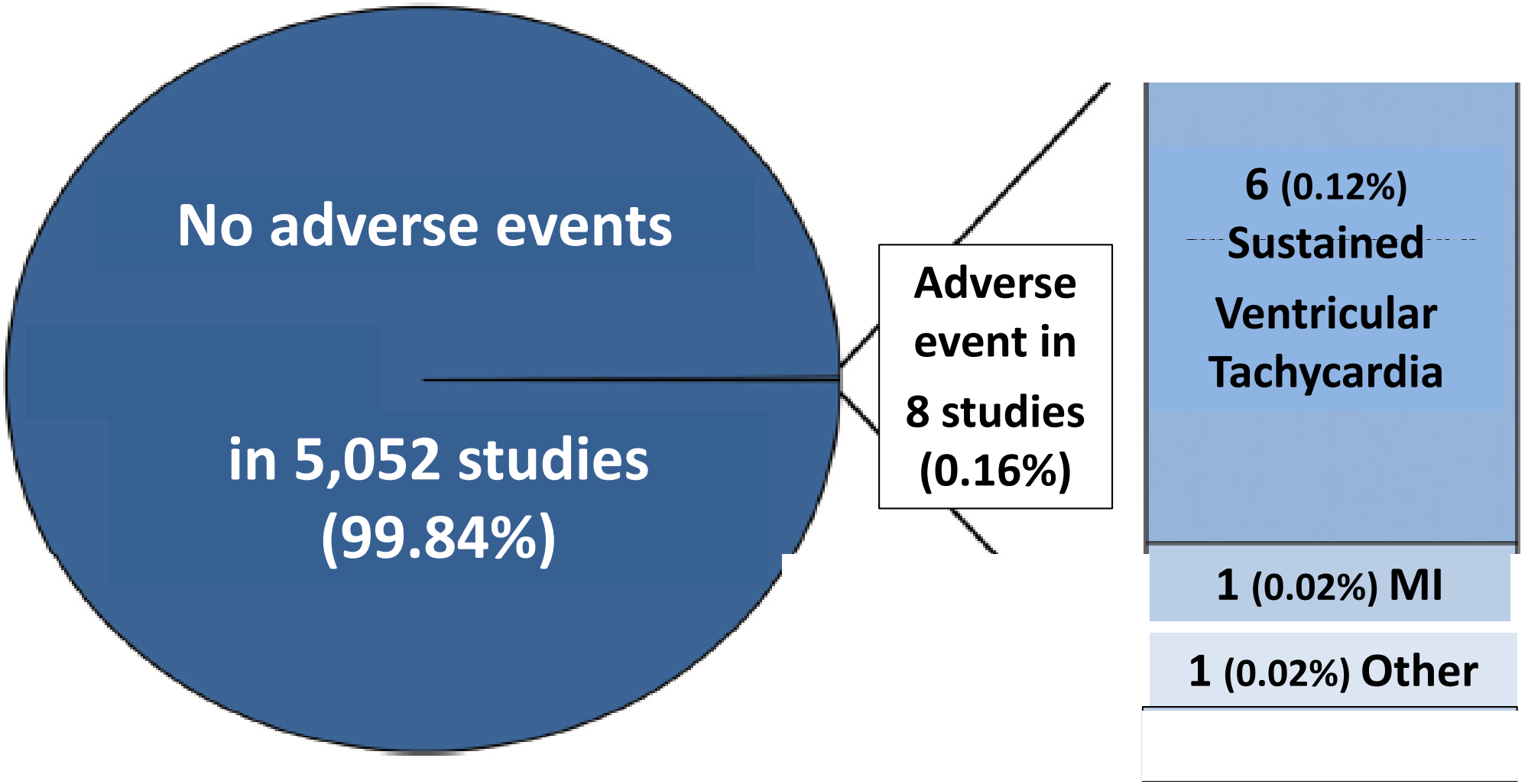

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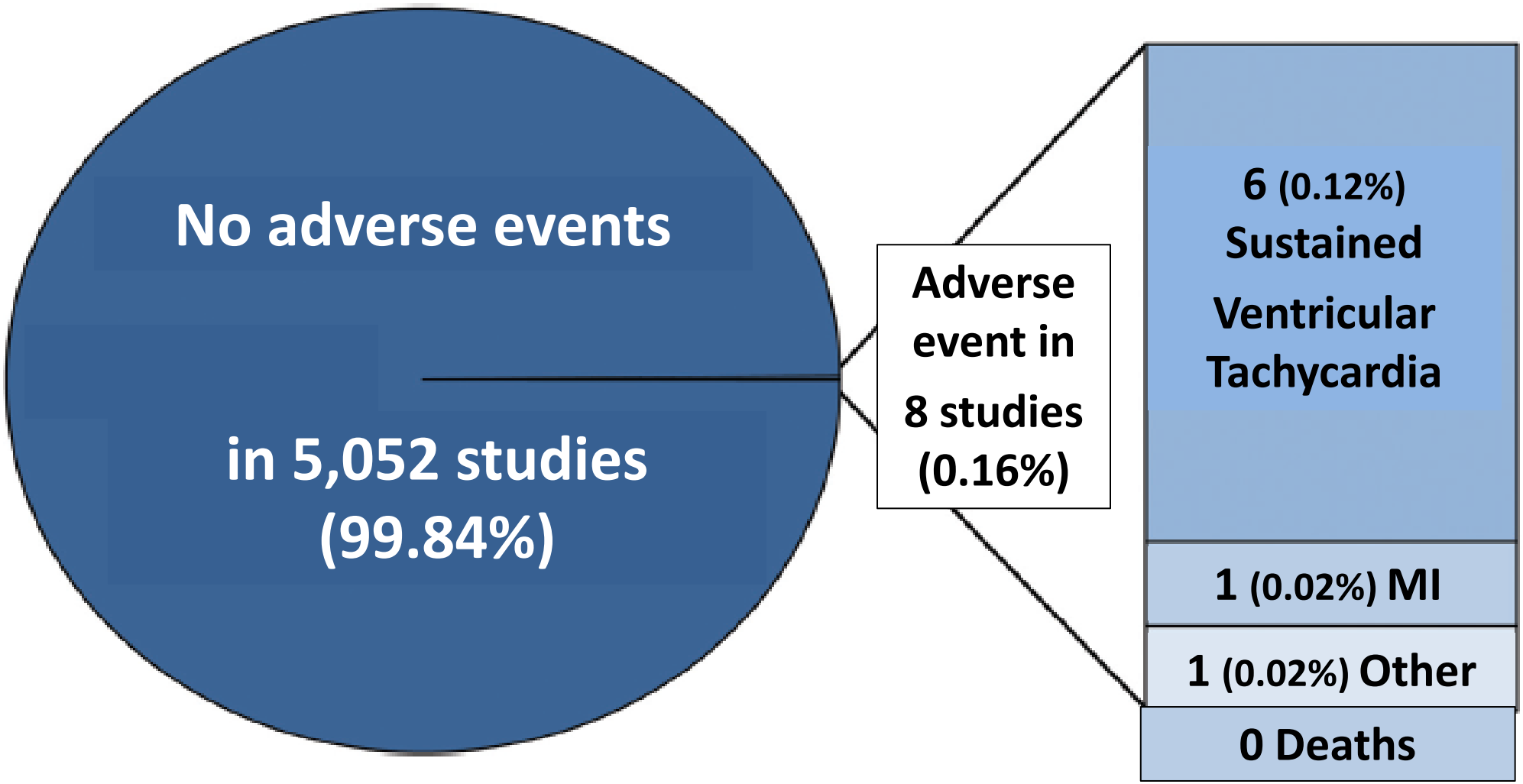

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Exercise Training and Implantable Cardioverter-Defibrillator Shocks in Patients With Heart Failure

Results From HF-ACTION (Heart Failure and A Controlled Trial Investigating Outcomes of Exercise TraiNing)

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Durham, North Carolina; Philadelphia, Pennsylvania; Detroit, Michigan; and Cleveland, Ohio

Piccini et al. *J Am Coll Cardiol* HF 2013;1:142-148

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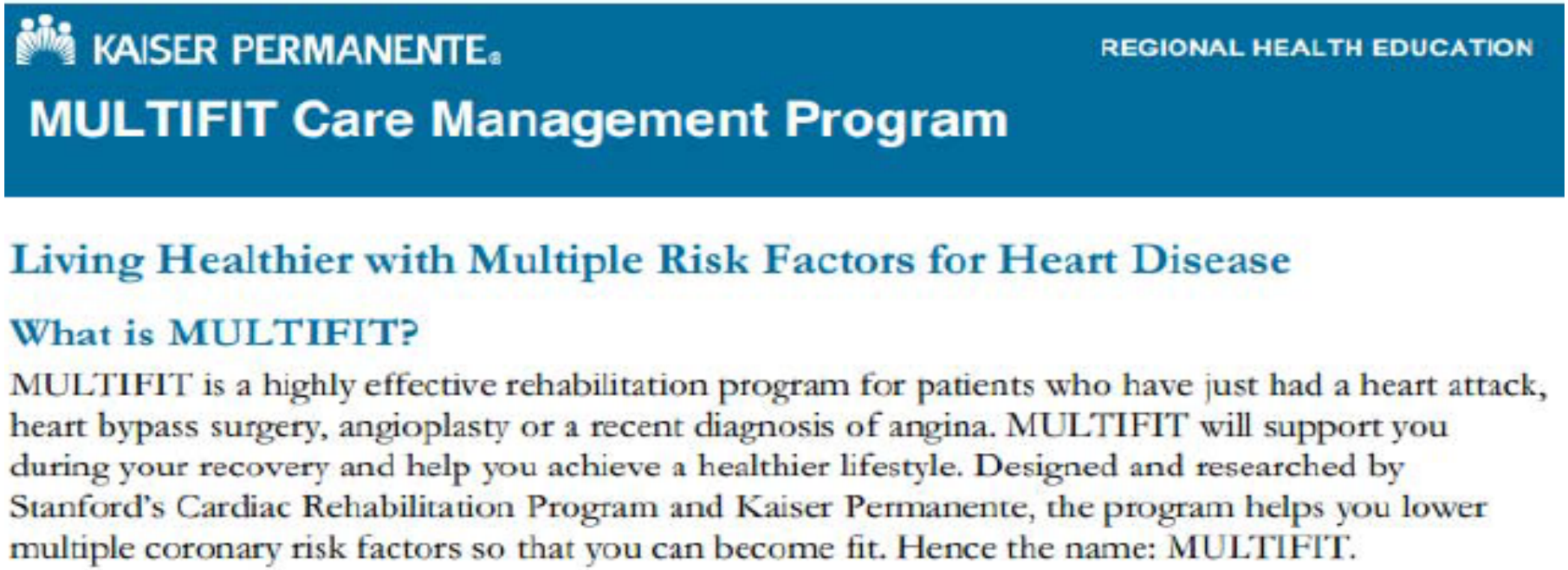
→ **No evidence of increased ICD shocks associated with exercise training (n=546) vs. usual care (n=507) in patients with HF and reduced LVEF.**

Piccini et al. *J Am Coll Cardiol* HF 2013;1:142-148

Kaiser Permanente Multifit Program



KAISER PERMANENTE®

REGIONAL HEALTH EDUCATION

MULTIFIT Care Management Program

Living Healthier with Multiple Risk Factors for Heart Disease

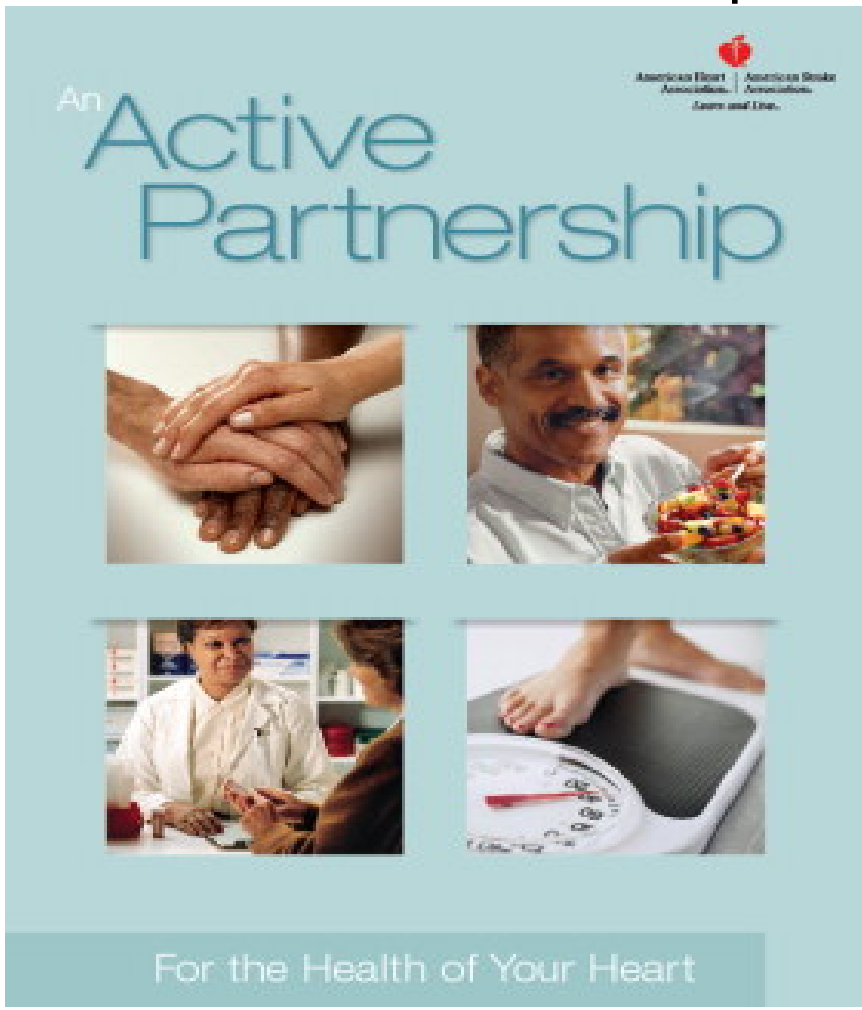
What is MULTIFIT?

MULTIFIT is a highly effective rehabilitation program for patients who have just had a heart attack, heart bypass surgery, angioplasty or a recent diagnosis of angina. MULTIFIT will support you during your recovery and help you achieve a healthier lifestyle. Designed and researched by Stanford's Cardiac Rehabilitation Program and Kaiser Permanente, the program helps you lower multiple coronary risk factors so that you can become fit. Hence the name: MULTIFIT.

http://www.permanente.net/homepage/kaiser/pdf/6377.pdf

American Heart Association (AHA), January 2013

"An Active Partnership For the Health of Your Heart"



Remote Cardiac Rehab Program, Iowa City VA

Veteran's Rural Health Resource Center-Central Region

Project Lead: Bonnie Wakefield, PhD

Following discharge from a cardiac event, traditional rehabilitation is often provided in a hospital setting. This rehab requires the patient to come in for outpatient sessions three times a week for twelve weeks. These travel arrangements and the impact on patient work schedules can make it difficult for them to attend these sessions, especially for Veterans living in rural areas. To address this issue, this pilot program tested the feasibility of Remote Delivery of Cardiac Rehabilitation program in which patients received similar rehabilitation services while in their home.

In other words, the Remote Delivery of Cardiac Rehabilitation program gives patients another option for cardiac rehabilitation. Focused on Veterans who had recently had a myocardial infarction (heart attack), coronary artery bypass graft procedure (CABG), percutaneous coronary intervention (PCI), or stable angina, this program was developed to include the benefits of traditional outpatient programs through a home-based setting. Patients participated in a twelve-week long program consisting of nutrition, exercise, and heart disease educational information. Additionally, patients were provided with materials to aid in lifestyle modifications including a blood pressure cuff, pedometer, peddler, and heart rate monitor. Patients received weekly calls to monitor progress, discuss nutrition, exercise, and heart disease, and how to make appropriate life style and risk factor modifications.

The overwhelming response to this program has been positive. Overall participants were highly satisfied with their care and patient health improved. To help disseminate this program more widely, a toolkit has been created to provide recommendations for program implementation and quality monitoring. This toolkit includes a Program Implementation Manual, a Patient Manual, and a cost analysis spreadsheet and can be provided to interested individuals by contacting the Central Region staff.

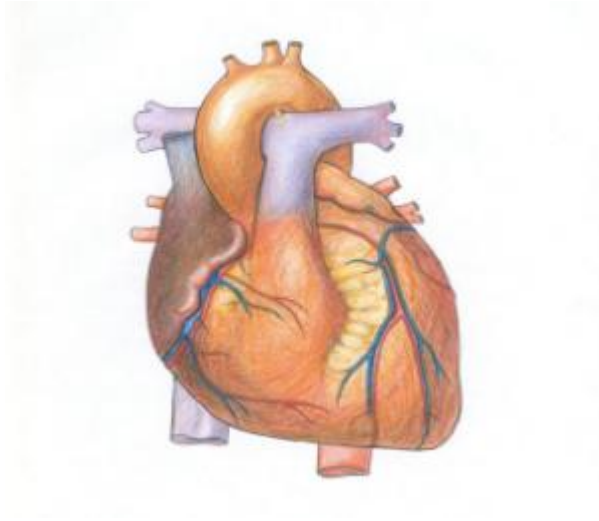
http://www.ruralhealth.va.gov/resource-centers/central/cardiac-rehab.asp

Pedometer ($27)

TheraBand

Exercise Peddler ($25)

Conclusions



- Cardiac rehabilitation improves cardiac outcomes
- Vastly underutilized both inside and outside VA
- Geographic distance a major barrier
- Home cardiac rehab and new technologies may improve utilization

Contact Information

- Dr. Dan Forman: deforman@partners.org
- Dr. Mary Whooley: mary.whooley@ucsf.edu